Title: Executive Function and Adaptive Behavior in Young Adults with Down Syndrome

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Introduction: Individuals with DS demonstrate difficulties with executive function that emerge in early childhood (Daunhauer et al., 2014) and persist through adolescence (Lee et al., 2015) and adulthood (De Sola et al., 2015). In particular, parents and caregivers report that individuals with DS experience relative challenges in working memory and planning in childhood and adolescence (Daunhauer et al., 2014; Lee et al., 2015). Research on executive function in adulthood is primarily based on laboratory tasks and little is known about executive function profiles in everyday life using ecologically valid measures. In addition, it is unclear how caregiver reports of executive function predict adaptive behavior in young adults with DS. The purpose of this study was to examine parent and caregiver reported profiles of executive function and adaptive behavior in young adults with DS and the extent to which executive function predicts adaptive behavior.

Method: Participants included 26 adults with DS ages 19-34 (Mean Age = 25.5 years; SD = 4.68). Caregivers completed an informant-report measure of executive function in everyday life using the Behavior Rating Inventory of Executive Function-Adult Version (BRIEF-A; Roth, Isquith, & Gioia, 2005) and adaptive behavior using the Vineland Adaptive Behavior Scales-2nd edition survey interview format (VABS-2; Sparrow, Cicchetti, & Balla, 2008).

Results: Repeated measures multivariate analysis of variances (RM-MANOVAs) were performed to assess the profile of executive function subdomains of the BRIEF-A and the profile of adaptive behavior subdomains of the VABS-2. Significant within-group differences were found on the domains on the BRIEF-A, $F(8, 152) = 14.8, p < .001$. Specifically, caregivers reported greater difficulties in the Shift, Working Memory, Plan/Organize, and Task Monitor domains and relatively fewer difficulties in the Inhibit, Emotional Control, Self- Monitor, Initiate, and Organization of Materials domains of the BRIEF-A. In addition, significant within-group differences were found on the domains of the VABS-2, $F(8, 152) = 27.9, p < .001$. Specifically, caregivers reported pronounced difficulties in the Expressive and Written subdomains of the Communication domain and the Domestic and Community subdomains of the Daily Living Skills domain.

Moderate to large significant negative associations were found between Shift and all domains of reported difficulty on the VABS-2 ($r = -.41 - -.62$). Moderate to large significant negative associations were also found between Working Memory and Written, Domestic, and Community ($r = -.43-.58$), Task Monitor and Expressive, Written, and Community ($r = -.45-.58$), and Plan/Organize and Written and Community ($r = -.42 -.48$). All domains of the BRIEF-A were largely significantly positively associated. Based on the strongest associations, the Shift domain was selected for multivariate multiple regression to examine the extent to which shifting predicted Expressive, Written, Domestic, and Community adaptive behavior skills. Overall, the model was significant, $F(4, 19) = 4.32, p = .012$, with shifting accounting for 48% of adaptive behavior. Specifically, higher levels of shifting difficulties were associated with decreased levels of Expressive ($B = -.50, p = .040$), Written ($B = -.82, p = .001$), Domestic ($B = -.72, p = .008$) and Community ($B = -.53, p = .042$) adaptive behavior skills.

Discussion: These findings replicate patterns observed in caregiver reports of EF in childhood and adolescence in DS, including a pattern of distinct difficulties with working memory and planning and organizing. Shifting was a new caregiver-reported relative area of difficulty in this study. In terms of adaptive behavior, results replicated previous findings of expressive language difficulties across the lifespan in DS (Fidler et al., 2006; van Duijn et al., 2010). In contrast with previous work on adults with DS, domestic and community daily living skills were reported as relative challenges (Dressler et al., 2010). These results suggest that shifting difficulties are related to decreased levels of adaptive behavior. Additionally, given the biomedical vulnerabilities associated with DS, more research is needed to better understand the impact of executive function on adaptive behavior in young adults with DS who are at risk for dementia.
References/Citations:


